Navigating Daily Life with Prostheses: Challenges, Coping Strategies, and Psychological Factors in Lower Limb Amputees – A Field Study

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Summary

A field study with 12 lower limb amputees (aged 17–66, M = 43.9, SD = 18.6) examined their daily challenges and coping strategies. Participants walked a predefined route in the city, navigating varied terrains while discussing difficulties with the experiment leader. Prior to the walk, they completed a survey on personality, stress coping, and prosthesis experiences, followed by an interview on prosthetic challenges and psychological factors. Results showed correlations between prosthesis adjustment and coping strategies, with extraversion positively linked to active stress management. Interviews emphasized the need for better prosthetic functionality, social support, and effective coping strategies.

Introduction

The study of individuals with lower limb amputations within their daily environments provides essential information on the challenges they face, how surrounding factors come into play, and the strategies they adopt to cope. This research seeks to pinpoint critical elements that impact prosthetic rehabilitation and explore how personality affects adaptation to prosthetics and the implementation of active stress management techniques.

Methods

A field study was conducted with 12 lower limb amputees, aged between 17 and 66 years (M = 43.9, SD = 18.6). Each participant, accompanied by the experiment leader, traversed a predetermined route in Darmstadt, which included varied terrains such as different types of soil, stairs, grassy areas and zones with high traffic density. During the walk, participants articulated the difficulties encountered and the strategies employed to overcome these challenges. Prior to this activity, they completed an online survey and participated in a semi-structured interview with the experiment leader. The online survey comprised personality assessment (BFI-10)[1], stress and coping strategies (SCI)[2] and prosthesis-related data (TAPES-R)[3]. The semi-structured interview focused on the daily challenges associated with the use of prosthesis, the corresponding coping strategies, and the psychological factors related to it. In addition, participants were asked about the improvement of technological prostheses and their impact on their lives. The study was approved by the Ethics Commission of the TU Darmstadt.

Results and Discussion

Participants reported average to above-average TAPES-R scores, with three indicating high psychological stress. Positive correlations emerged between the TAPES-R and SCI subscales (Table 1), and extraversion was associated with active stress management ($r = .71$, $p < .009$). During the walk, challenges with uneven surfaces were highlighted, including cobblestones, loose stones, and slippery surfaces such as leaves or marble floors. Many noted that navigating uphill, downhill and sideways slopes proved problematic due to the limitations of the prosthetic limb in fully extending or maintaining stable footing. Emotional resilience, self-image concerns, and the search for social acceptance emerged as pivotal factors in participants' daily lives. The transition to advanced materials such as carbon and silicone and the enhancement of the knee and foot mechanisms were perceived as beneficial; however, issues such as weight, lack of customization, and water resistance remained problematic. The positive correlations between TAPES-R and SCI subscales suggest that effective stress coping strategies are closely linked to better prosthetic adjustment. In particular, extraversion was positively associated with active stress management, indicating that outgoing individuals can be more proactive in addressing challenges, seeking support, and employing problem solving strategies. Future research should investigate larger samples to validate these associations and explore customized interventions that address both the functional and emotional needs of amputees.

Conclusions

These findings emphasize the need for interdisciplinary rehabilitation approaches that integrate physical, psychological, and social support to foster holistic recovery and long-term well-being.

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References

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Table 1: Significant Correlations (* & ***) between SCI and TAPES-R Subscales.

	(SCI) Positive Thinking	(SCI) Hold on Faith
(TAPES-R) General Adjustment	p <.02*	p <.02*
(TAPES-R) Social Adjustment	p <.001***	p >.05